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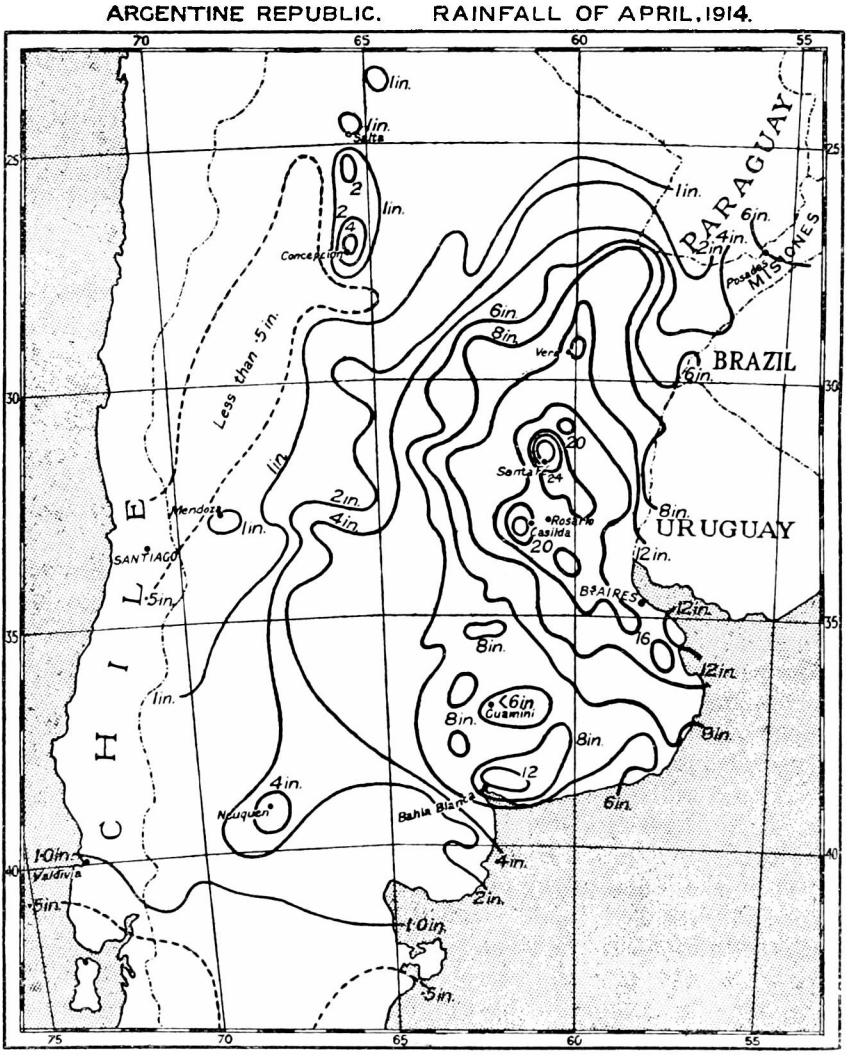
THE EDINBURGH METEOROLOGICAL CONFERENCE.

The programme which has just been issued in connection with the Meteorological conference to be held in Edinburgh, from September 7th-12th, by invitation of the Scottish Meteorological Society, is one that should appeal strongly to all interested in the science of Meteorology. The beauties and academic attractions of the modern Athens, combined with a Conference of such advantage to all students of Meteorology, should ensure a large gathering. Proceedings will open on the Monday evening (September 7th), with a reception, and on the Tuesday morning the President, Admiral Sir Edmond Slade, K.C.I.E., K.C.V.O., will deliver an address. The same evening the visitors will be the guests of Mr. J. Mackay Bernard, the President of the Scottish Meteorological Society. A reception will also be held at the City Chambers on the invitation of the Lord Provost, Magistrates and Council of the City of Edinburgh. Popular lectures will be given on other evenings by Mr. C. J. P. Cave on "The Exploration of the Atmosphere," and Mr. C. T. R. Wilson, F.R.S., on "Atmospheric Electricity." The Conference will on most days meet in two sections and opening addresses will be delivered by Professor R. A. Sampson, Astronomer Royal for Scotland, on "Meteorology as an Exact Science," while Dr. Shaw will speak on "The Position of the Observational Physical Sciences in British Universities and Schools." Dr. Chree will give an address on "Terrestrial Magnetism," and Mr. J. S. Dines will discourse on "Meteorology and Aeronautics." The other opening addresses will be delivered by Dr. Shaw, "Correlation in the Meteorology of the Globe," ; Dr. G. A. Carse, "Atmospheric Electricity " ; and Prof. D'Arcy Thompson, C.B., "Periodic Variations in Mean Sea-level." In addition to the opening addresses nearly twenty papers, many by well-known meteorologists, have been already promised. A number of interesting excursions have been arranged, one of which will be to the Royal Observatory on the invitation of Prof. Sampson, when a demonstration of Balloons for meteorological purposes will take place.

Other attractions of a varied character have been arranged, full particulars of which will be found in the circular which appears in this issue of the Magazine.

HEAVY RAINS IN THE ARGENTINE REPUBLIC.

THROUGH the kindness of Mr. W. G. Davis, Director of the Argentine Meteorological Office, we are able to give a map showing the rainfall of April over the Argentine Republic and contiguous regions north of latitude 37°S. This map was prepared by Mr. Helm Clayton, Chief of the Forecast Division, and shows in a striking manner the



remarkable character of the April rains to which reference was made in our last number. The map explains itself, but Mr. Clayton has added some general particulars of considerable interest. He says " at the same time that this heavy rainfall was occurring in

Argentina, the rainfall was so light in Misiones and Southern Brazil that the Alta Parana at Posadas was the lowest ever observed, so far as shown by the records of the Hydrometric section. The rainfall in southern Chile was also abnormally low and had been below normal for several months preceding." Mr. Clayton has given some of the actual monthly rain totals, from which it appears that the rainfall in Buenos Ayres was 14·29 in., Rosario 15·83 ins., Santa Fe 24·80 ins., and Santo Tomé, in the province of Santa Fe, 30·35 ins. The normal April rainfall for the first three stations quoted above is respectively 3·00, 3·11, and 3·35 ins., so that from five to eight times the average fall was experienced at the places under consideratiom. At Buenos Ayres the only wetter month since the record began in 1861 was March, 1900, when 21·44 ins. fell, the previous wettest April having been that of 1884, when 8·35 ins. was recorded. From the isohyetal lines it would appear that at Ajo the rainfall was about 12 ins., the only wetter months since 1858 being those of March, 1900 (15·88 ins.) and September, 1884(12·64 ins.). On the other hand from about latitude 40° to 42° S., on the Chilian littoral, and probably further south, a remarkable deficiency was noted, Valdivia having about an inch and Puerto Montt only 0·40 in. of rain in April, against an average of 9·33 and 7·05 ins. respectively. Reference to a long record at Puerto Montt shows that the driest April previously recorded was 2·72 ins. in 1896.

While it is very difficult, in the absence of weather maps, to form a picture of the precise conditions that led to these remarkable variations in rainfall on the South American continent, between the Tropic of Capricorn and latitude 37°, it is quite obvious, from the Chilian data, that the South Pacific high pressure system was not only lying further south and east, but was also more intense than usual. The cyclonic disturbances that gave the heavy Argentine rains apparently came from the Atlantic, so that we should expect to find that the southern high pressure belt over this ocean was located north and west of its normal situation.

THE WEATHER OF JUNE.

THE mean temperature of the month, taking the British Isles as a whole, differed but little from the average. From the data given in the *Weekly Weather Reports* of the Meteorological Office, it was found that the only district showing a temperature below the normal was the north of Ireland. In the Channel Islands the mean temperature was just the average, and there was an excess of about 1° in the north-eastern part of the country, in the Midland Counties, and in the south of Ireland. In western districts, except for a burst of very unusual warmth during the third week of the month, cool weather prevailed in general, but in eastern districts the warmth

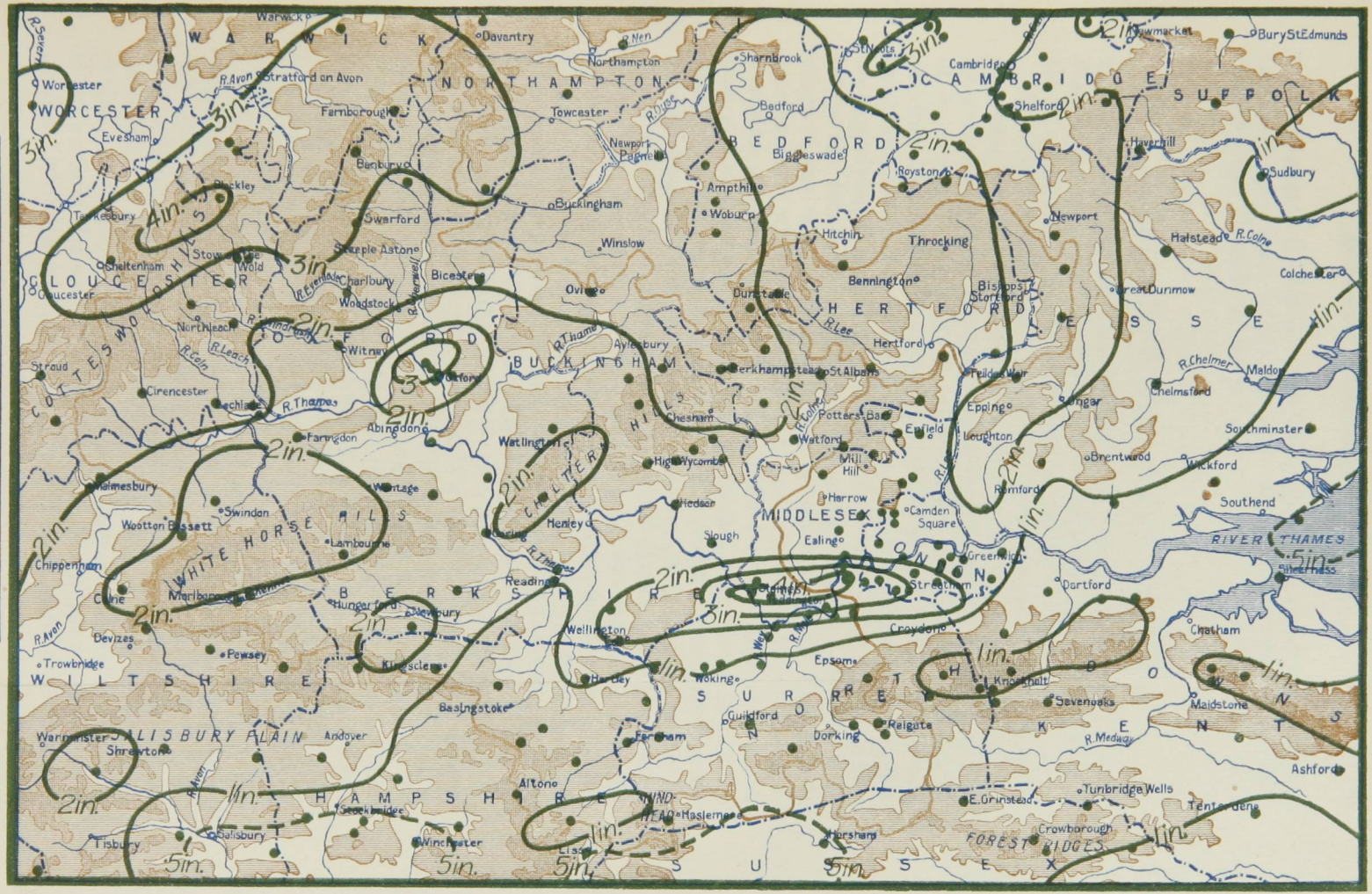
continued in a modified degree until the close of the month, when very warm weather was being experienced.

At the beginning of the month a shallow depression, in its passage across Scotland and the adjacent portion of the North Sea, was accompanied, on the more exposed parts of our northern coasts, by winds of gale force blowing from the west or north-west. Cold weather was experienced, the shade thermometer on the 1st falling to freezing point at West Linton, and on the 3rd to 33° at such widely separated localities as Balmoral, Rounton, and Falkirk. At Crieff on this day temperature rose to 78°, but at Blackpool and Valentia did not exceed 62°. Until about the 12th, temperature continued, on the whole, under the average, the day maxima being low and with minima falling on the 7th to or below freezing point in some parts of Scotland, the lowest being 31° at Balmoral. Thunderstorms were frequent and accompanied by daily rains exceeding an inch and a half in some localities.

An irregular type of pressure distribution on Sunday, the 14th, was associated with a remarkable thunderstorm in South London and the lower Thames valley. The focus of maximum rainfall appears to have occurred in the vicinity of Richmond Park, where 3·7 in. fell within two hours and forty-five minutes. Rainfalls exceeding 3 in. occurred at Staines, 3·47 ins., and at Ashford (Middlesex) where 3·3 ins. was recorded. More than two inches fell on this day in an elliptical area extending from Dulwich to west of Egham, the total width of the two-inch area being, on the average, four miles. Although the limits of this storm were pretty sharply defined, no rain falling in many areas contiguous to that of heaviest fall, yet it is of interest to note that in the vicinity of Petersfield, and also in south Somerset, thunderstorms and torrential rains reaching to slightly more than two inches were recorded synchronously with the London storm. Hail in both storms was of general occurrence and in some cases of remarkable size. On the 19th a local rainstorm of quite exceptional severity was responsible at Carr Bridge (Inverness), for an extraordinary railway accident.

Some high temperatures occurred after the middle of the month, the maximum, at Balmoral on the 17th, rising to 88°, some five degrees higher than at any other reporting station in the British Isles. After this date, until very nearly the close of the month the weather conditions were comparatively normal, except the duration of bright sunshine, which was abundant in most places. A ground frost was recorded at Wisley on the 24th. On the 29th a marked rise of temperature occurred very generally, and on the last day of the month maxima ranging from 86° to 89° were recorded at the London stations, while values of 84° were noted in the Midlands. The high day values were also associated with unusual nocturnal warmth, the night minima being above 60° at many places in the south and east of England.

THAMES VALLEY RAINFALL. —— JUNE, 1914.



The general rainfall of the month expressed as a percentage of the average was:—England and Wales, 79 ; Scotland, 59 ; Ireland, 42 ; British Isles, 64.

ROYAL METEOROLOGICAL SOCIETY.

THE last meeting of this Society for the Session was held on Wednesday afternoon, June 17th, at 70, Victoria Street, Westminster, Mr. C. J. P. Cave, M.A., President, in the chair.

Mr. B. C. Wallis read a paper on "The rainfall of the Southern Pennines," in which he endeavoured to show that Lancashire owes its predominance in the cotton trade to the wetness and humidity of its climate. He made an examination of the average monthly pluviometric coefficents for a period of 35 years, and of the monthly variations in wind direction for twelve places in relation to the rain accompanying these winds, for a period of four years. The cotton towns are localised roughly on the 500 ft. contour on the slopes which form the catchment basin of the Irwell and Mersey river combination while the woollen towns are roughly at the same elevation beyond the hills. The difference in rainfall between west and east averages one inch per month, and during the winter months rainfall increases with the elevation, while during the summer rainfall decreases relatively with the elevation ; consequently at about the level of 500 ft. the rainfall is distributed most evenly throughout the year. The heaviness of the rainfall above the towns tends to keep the streams full, so that when they debouch on the lowland they wind and meander and lie like canals to the windward side of the cotton towns. Consequently the air of south-east Lancashire tends to be humid, the crescent circle of Upland restricts the free passage of the westerly and south-westerly winds, and the relative excess of warmth which characterises the air adds to the extent of the evaporation from the water surfaces of the many streams. Thus the local relief of the Pennine Upland gives to the cotton towns their characteristic climate, and is the dominant factor which has made Lancashire supreme in the cotton industry.

In the discussion that followed Mr. C. Salter gave a description of a series of maps of the average monthly rainfall in the British Isles, constructed by Dr. Mill and himself, some years ago, using a method somewhat similar to that followed by Mr. Wallis. On these maps were plotted the percentage of the years' total rainfall falling in each month on the average of 35 years, and these results were of considerable interest. In winter, for example, the greatest proportion of the year's rain fell at wet stations, in summer at dry stations. In spring and autumn the proportion was almost uniform in all parts of the country, but the fall was, on the whole, twice as great in October as in April. He regarded these maps as a convenient

steeping stone to the construction of monthly average rainfall maps, and proposed to attempt to combine them successively with a detailed map of the average rainfall with this object in view.

Mr. E. Gold pointed out that the " equipluves " were really the relation of the mean rainfall of a particular month with the mean rainfall of the year. He doubted the value of such " equipluves " as the range of values might conceivably be from 1200 to 0.

Mr. F. J. Brodie said that in the winter months the rainfall percentages were higher in the western part of the country, and in the summer months higher in the eastern parts. This might be due to the fact that the winter rain was generally cyclonic rain, while that in summer was mostly of the thunderstorm type. He believed thunderstorms were far more frequent in the east of the Kingdom than in the west.

Mr. E. M. Eaton differed emphatically from the author and urged that the reason the cotton industry was on the western slopes of the Pennines was owing to its proximity to the western ports and because the raw materials can be readily obtained. The industry cannot live in Derbyshire because they cannot get the materials at a price that would pay for working

In reply to Mr. Gold, Mr. Wallis said that such a range as he suggested would only occur in dealing with tropical data. He thought that 150 to 60 would be about the limits in this country. He asked Mr. Eaton, if his argument held, why was there no cotton industry in the neighbourhood of Bristol, and of Glasgow, and why did it not pay at Warrington ?

Mr. H. J. Bartlett read a paper on the " The relation between wind direction and rainfall " He examined the relation between wind direction and amount of rain from the hourly readings obtained from self-recording instruments at the four Observatories at Valencia, Aberdeen, Falmouth, and Kew for the decade 1901-1910. At the four Observatories a large proportion of the total rain falls with wind in the south-east and south-west quadrant, except in the case of Aberdeen, where the amount in the north-west quadrant is relatively high. The greatest amounts at Kew and Falmouth are with a south-west wind, respectively 22 and 28 per cent. At Aberdeen the south-east wind brings the highest amount, 20 per cent., while Valencia receives 30 per cent. with south, 20 per cent. with south-east, and 15 per cent. with the south-west wind during the year. The author showed graphically the percentage of winds in each quadrant for each month of the year at all four Observatories.

A third paper on " Barometric changes and rainfall," by Mr. E. H. Chapman, M. A.,was also read. The author endeavoured to ascertain a numerical measure of the relationship existing between barometric pressure and its changes and rainfall under various conditions. Five places, Southampton, Woolacombe, Armagh,

Laudale and Scarborough, were dealt with and the data were extracted from " Observations at Stations of the Second Order " for the years 1900 to 1906. That rain follows a fall in pressure more often than not is well-known, but these results showed that the probability varies according to the direction of the wind, and the absolute height of the barometer. It is worth noting, too, that rain foretells a rise in the barometer, with rather more probability than does a fall in the barometer foretell rain.

The following gentlemen were elected Fellows of the Society—Mr. Joseph Edward Evans, Mr. Y. I. A. Lalljee, Professor L. A. H. Warren, Lieut. W. B. Wilkinson, R.N.R.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

VISIBILITY.

As your correspondents have lately been discussing " Visibility " or what I have in my papers called " the limit of Visibility," I would like to call attention to some results obtained from observations made here and published in the *Pro.Roy.Soc.Edin., 1892-93* Falkirk, owing to its situation, is particularly well suited for such observations, as the whole area within the N.W. quadrant is extremely thinly populated, so that the air coming from it to the place of observation is but little polluted, while the area from E. by S. to W. is at a distance of some miles densely populated and contains many Iron Works and other sources of pollution. The N.E. quadrant is much less densely populated. Some hundreds of observations were made, but these were reduced to a little over 200 by the rejection of a number which were unsuitable owing to recent rains, distant showers, and other unstable conditions.

The limit of visibility was measured by the visibility of more or less distant hills, Ben Ledi, distance 25 miles, was used when the air was clear, and nearer hills when it was invisible owing to haze.

The observations were placed in tables according to the direction of the wind and the humidity of the air at the time. For instance, the average of all the observations taken when the wind was from each direction and the wet-bulb depression was 2° being placed in one column, all those when it was 3° in the next column, and so on. The table thus shows the limit of visibility for each direction of wind at the different humidities.

By comparing the limit of visibility on the days when the air had the same humidity, the relative transparency of the winds from the

different directions has been obtained, that is the relative transparencies of the air from polluted and from unpolluted areas.

Winds from W., N.W. and N., are more than 9 times clearer than the southerly winds when the air is dry enough to give 3° or more of wet-bulb depression.

The air at Falkirk is about 10 times more hazed when the wind is E., S.E., S. and S.W., than it would be if there were no inhabitants in the country.

The transparency of the air increases with its dryness being 3·7 times clearer when the wet-bulb depression is 8° than when it is 2°.

The transparency of the air at any particular place would thus appear to be affected by its humidity, and by the density of the population in the direction from which the wind at the time blows. The effects of pollution are decreased by high winds.

Besides the impurities in the atmosphere other things affect its transparency. For instance, if the observations are made while looking towards the sun, the air seems to be much more hazed than when looking away from it. Want of uniformity in the humidity, and the temperature of the air, also reduce its transparency ; while a uniform canopy of clouds seems to increase it, probably by preventing the sun shining directly on the impurities, and by tending to promote a uniform condition of temperature and humidity in the air.

JOHN AITKEN.

Ardenlea, Falkirk, 20th June, 1914.

I THINK, with Mr. Dines, that there is no very definite connection between the transparency of the atmosphere and ensuing rainfall, except in extreme cases of visibility, so far as my experience goes, usually *do* portend rain.

When from Folkestone the French coast appears so near that the churches and trees in and around Boulogne can be clearly discerned, then the fishermen shake their heads. Similarly when from London-hackneyed Parliament Hill one can sometimes in summer see right across the city to the North Downs, an almost incredible other-world vision of the Kentish or Surrey hill lanes, then one may usually suspect showers, if not more pronounced rain, to be gathering.

L. C. W. BONACINA.

June 18th, 1914.

As a very amateur but very interested Observer for many years, it is with the greatest diffidence that I venture to write anything which conflicts with the opinion of so eminent a Meteorologist as Mr. Dines.

But I have been since boyhood a keen boat sailor and have associated with fishermen and yacht hands whose livelihood (and

sometimes lives) depend on accurate weather forecasting. They all agree with me in the statement, that here, at all events, winds from N.N.E. round to S.S.E. are accompanied by haze, especially when anti-cyclonic. I am not speaking of actual fog, which is frequent with S. and S.W. winds. Smoke will certainly not explain this haziness, as there is no land S. of a S.E. bearing here, and then only the Isle of Wight and the southern part of England on the bearings round to N.N.E. Whilst N. and W. and S. winds are clear as a rule.

On the other hand, *unusual* clearness is invariably associated here with rain, either recent or to come, whether in the day or in the night It is not seen when an anti-cyclone is giving place to a cyclonic system, but it is invariable, I may almost say, in the interval between successive cyclonic disturbances, and I regard it as a more reliable sign of coming rain in these circumstances than even a backing wind. When the houses on St. Catherine's Point can be seen from here, rain is certain in the next twenty-four hours, or, as the fishermen say at night, " The stars are right aboard of you."

FRANK BELBIN, F.R.C.S.

25, Knyveton Road, Bournemouth, June 22nd, 1914.

I THINK Mr. Dines' letter on this subject is so clear and convincing as to leave little or nothing more to be said on the general question, except that it leads one to the conclusion that it would be difficult to find any place in this country where visibility would be determined entirely by natural causes, to the exclusion of those which may be termed artificial.

Mr. Horner's observations and mine certainly seem discordant, but I think the local conditions at all the places he mentions, if duly considered, afford an explanation. Ilfracombe is surely quite within the influence of the South Wales coalfield. At Worthing his view of Brighton with an easterly wind would be obscured by the smoke of Brighton itself, which is by no means a negligible quantity; and at Wesgate-on-Sea he has Margate, a good-sized town, immediately to the east of him.

H. S. TABOR, F.R.Met.Soc.

Fennes, Braintree, July 6th, 1914.

I AM very surprised at Mr. Dines not thinking visibility a sign of rain. Hereabouts it is always considered to be one. For instance, when certain landmarks are unusually clear, such as Lympne Castle, 15 miles E., the hills near Ightham, 23 miles N.W., (on this side of Sevenoaks), Fairlight Church (near Hastings,) and Brightling Obelisk, 14 and 16 miles S. and S.W. respectively, or when the mid-Kent chalk range to N. is clear and distinct above the parallel

ragstone range; specially too, when the telescope shows ships off Hythe and Romney. As an example of this on August 18th, 1909, I saw the Folkestone boat crossing, 24 miles off, and a fortnight of wet weather followed. Again, and this perhaps is even more noteworthy, when at night the flashes of Grisnez Lighthouse, 42 miles E., and the glare of London, 46 miles N.W., illumine the clouds, bad weather generally follows. A particular instance being one night in December, when the London light was very conspicuous, and there came a heavy snowstorm next day.

The N.W. wind is often thick, probably from London smoke, this may perhaps lessen visibility after rain here.

J. E. MACE.

View Tower, Tenterden July 6th, 1914.

THUNDERSTORM OF JUNE 14th.

THE phenomena associated with the thunderstorm of June 14th are, in some respects, so interesting that I am anxious, if possible, to carry out an investigation of the storm on the same lines as that of the " Derby Day " thunderstorm of May 31st, 1911.

Readers of *Symons's Meteorological Magazine* would assist greatly in the enquiry if *any* information relative to the storms could be sent to me at the address below. The information most valuable would be precise data of the *time* at which rain fell, or did not fall. The fact that rain was not falling may be of equal importance to the fact that it was falling, and negative information should not be omitted. Other observations of value would be those of the time of hail, thunder, lightning, etc., and particulars of the time that the sky became clouded, or free from cloud would not be without value.

I should like to take this early opportunity of thanking all those who have already sent me reports, many of them most valuable. The investigation will necessarily take some time, so that it may be a good many months before results are ready for publication.

J. FAIRGRIEVE.

Frocester, Friern Lane, New Southgate, London, N.

No doubt you will have different accounts of the thunderstorms which passed over South London on Sunday afternoon, because some places were flooded out, while at others only a few drops of rain fell. The first storm began here at about 12.24 p.m., and came right overhead from east, with terrific flashes of forked lightning and loud peals of thunder, then at 12.31 p.m. down came the rain with extraordinary fury; within 9 minutes ·50 in. had fallen. The second storm came up just after 1 p.m., the lightning

being even more severe, At 1.30 p.m. St. Mark's Church, Clarendon Road, was struck, and the Holy Cross, Catford, and a tree in Hither Green Cemetery, over thirty feet in height, was splintered, and two houses were also struck at Catford. The peals of thunder shook the house dreadfully, another came up at 2.25 p.m. with torrents of rain, and hailstones as large as haricot beans fell for about five minutes, being the largest I have ever seen; the flashes of lightning were very dangerous, and were followed by awful peals of thunder which caused sensible vibrations again. Four more storms passed over and around us between 3 and 5 p.m., but were only slight; by evening the clouds cleared, and the sun shone brightly everywhere. So still and delightful after such a day of storms, which will be remembered in this district for many years to come.

G. E. DACEY.

Lewisham.

If a full account of the thunderstorms of the 14th inst. is undertaken the following notes may be helpful. My house, at 350 feet, gives a clear outlook northwards.

1. The storm did not give any rain here, except a drop or two—not large—about 2 o'clock.

2. On the Brighton Road, in Croydon, it rained sharply for two or three minutes, about 3 o'clock, or after, near the "Red Deer" (of rainfall, Dr. G. J. Hinde, 24, Avondale Road). Half a mile further north ("Swan and Sugarloaf") there was a heavy drenching.

3. Here thunder was heard with little intermission (but not a continuous roar, simply frequent peals), from 12.30 to 5.30 p.m. It was noticed that the lightning, extending from N.E. to N.W., and mainly W. of N., was remarkably vertical, evoking the comment that we were sure to hear of much damage in the morning.

4. Going outside at 3.30, a magnificent cloud pillar was noted from N.E. towards N., over the western end of Croham Hurst. It was estimated as rising to about 30° altitude, but rough measurements taken yesterday indicate that it may not have been more than 25°, and stretching over about 18° in azimuth. Billowy masses were constantly rising out of it with rapid changes.

Some of these, evidently more distant from us, were brilliantly lit up, but most, including the main mass, were dark and evidently in the shadow of a vast and very lofty canopy of cloud, the fringe of which was thin and bright. It reached back over the whole heavens, still with the appearance in the N.W. of a thunderstorm passing away. Below it from E. of the cloud pillar to nearly S. blue sky was visible, through haze and also, though much more obscured, on the north side. The cloud pillar rose rather higher and by 3.45 began to merge with the canopy above it, apparently inducing rain from that, which obscured the outlines.

Assuming that this cloud was the thunderstorm over Beckenham (Kent House Station, 6 miles off) and Lewisham (8 miles distant), and that the lower level was some quarter mile high, its summit must have risen fully three miles above the base.

J. EDMUND CLARK.

Asgarth, Riddlesdown Road, Purley, Surrey, June 16th, 1914.

HEAVY SHORT PERIOD RAINFALL ON JULY 2nd.

THUNDER and rain commenced at 12.10 p.m. immediately accompanied with hurricane squall and hail. Lull at 12.15 when gauge was taken, giving ·54 ins., equal to 6·48 ins. per hour, thunderstorms and rain till night; rain early on July 3rd. Amount at 9.15 a.m. on July 3rd, 1·88 ins. (for month 2·48 in.). Old Howard funnel gauge gave 1·83 showing that Snowdon-Symons gauge retained the hail. Much damage was done by the squall at Ormesby station 7-8th of a mile west of this. Tree tops were taken off, a strong fence cleared of its rails, and two houses damaged and a chimney blown down. The path of extreme force of squall was only about 50 ft. wide. The air in this part contained floating branches of trees and leaves, temperature fell from 68° to 63°, but rose at once to 68°. Maximum in morning had been 78°. Morning was bright. Minimum July 3rd at 9.15 p.m. 53°, wind westerly. No hail 1¼ miles S.W. of this at Munthorpe, which stands about 150 ft. above this, which is 100 ft. above sea-level. On a steamer going its trial trip at the Teesmouth a gentleman (Mr. Lucas), was struck and stunned by a piece of ice which was measured, being 2½ by 1 inch.

W. STEWART TAILYOUR.

Ormesby, S.O., July 3rd, 1914.

THUNDERSTORMS AND CHANGES OF TEMPERATURE.

ON July 1st we had thunderstorms at about 8 a.m., 4.30 p.m., and near midnight. The one at 4.30 p.m. was very heavy and it came up from the south on a high wind with rain and hail and sand. The rain was torrential during about 20 minutes, and the fall during the storm amounted to 1¼ in. The rush of water through some of the streets was tremendous, and appears to have exceeded previous experiences. Extensive flooding and damage resulted in various districts. Between 3 and 4.30 p.m. the shade thermometer at 4 ft. fell from 88° to 67°.

Much colder weather followed the heat of June 30th and July 1st and on the morning of July 4th the minimum thermometer recorded 42°·8. An instrument on the grass must have fallen to within

a few degrees of the freezing point, as the night was very clear. There was quite a fog in the earlier hours, strikingly recalling the aspect of Nature on an Autumn morning.

W. F. DENNING, F.R.A.S.

Bristol, July 4th, 1914.

THE MAY FROSTS.

It may be of interest to your readers to know that in the district between the Hogs Back and Hindhead the frosts of May 26th and 27th destroyed many of the growing tops of bracken, only those in sheltered places being unaffected. Potato crops were also blackened, excepting in elevated parts on sandy soil. On my own ground (altitude about 410 ft.) they were unaffected. A neighbour had some frosted in the valley, while others higher up escaped, and I am informed that those on the sandy heights at Hale (about 600 ft.) escaped. Our own garden flowers and stone fruit crops were unaffected, including sweet peas and garden tropaeolums, nectarines and peaches. Of wild flowers I noticed that geranium lucidum had its leaves turned red as with autumn frosts. Young oak seedlings in exposed places also suffered, most of the larger trees escaping. Spanish chestnuts appear to have escaped injury. I saw no ash leaves frosted, but we have not many in this neighbourhood.

F. R. WALTERS.

Pinecroft, Farnham, Surrey, 19th June, 1914.

WEATHER ON JUNE 10th.

I should be extremely obliged if any of your readers (living at or near the following places, Stamford Hill, Enfield, Hertford, St. Albans, Hitchin, Luton, Woburn, Ampthill, Bedford, Wellingborough, Rothwell, Leicester, Derby, and Buxton), who observe and make notes of weather happenings, would send me notes of weather experienced form 7.30 a.m. until about 6 p.m. on Wednesday 10th June, and particularly regarding the behaviour of a detached cumulo-nimbus which passed in an apparently straight line from a point between Barnet and Enfield at 7.45 a.m. (then in an embryo state), in a N.N.W. direction, passing midway between St. Albans and Hertford, and Luton and Hitchin respectively, at a rate of about 20 miles per hour. According to press reports a violent hailstorm occurred along the path of this cloud, and since no other clouds of any significance were about immediately preceding the storm or during the day following (at least not in this vicinity) it should be comparatively easy to trace the history of this cloud, its growth from the initial stages, possibly south of the Thames, until it lost its activity and degraded, or lost its identity in the cloud mass in

connection with a depression situated over the western counties on that day, and where thunderstorms occurred during the afternoon. A. S. MARTIN-SMITH.

71, Wood Street, Barnet, Herts., 2nd July, 1914.

FALL OF TEMPERATURE.

THE remarkable drop in temperature between Wednesday and Friday last week as exemplified at our high level station, may be of interest. On Wednesday 1st inst., at 4 p.m., the dry bulb read 86°·8, the day's maximum of 87°·2 having occurred some half-hour previously. Exactly 48 hours later, at 4 p.m. on July 3rd, the dry bulb stood at 51°·9, this being 0°·1 above the minimum for the day, which occurred a little later, the thermometer thereafter rising to 53°·2 at 9 p.m. At 1 p.m. the reading was just over 63°, and the day's maximum was 64°·3. We thus get a difference of 34°·9 between the 4 p.m. readings of July 1st and 3rd.

We had 15 hours sunshine on 30th, the highest daily figure yet recorded at the Observatory (since 1910), and while the shaded maximum was 82°, the black bulb on 29th reached 136°·9, the highest but one we have yet observed. On the following day, with the screen maximum of 87°·2 the black bulb highest was 132°·3

ERIC L. HAWKE, F.R.Met.Soc.

2, Frognal Gardens, Hampstead, N.W., July 8th, 1914.

ARE ENGLISH THUNDERSTORMS MORE DANGEROUS THAN INDIAN?

THE sudden violent thunderstorms of June, 1914, were typical of conditions very common in England during the solstitial period May to July. Apart from the appalling storm of June 14th in south London, there was hardly a day during the first three weeks of the month when the newspapers did not contain melancholy reports of lightning casualties up and down the country. Sir John Moore, in his "Meteorology," lays great emphasis on the frequency and violence of English thunderstorms, in comparison with Irish and Scottish, and rightly so. But I want to ask readers who have been in India whether lightning casualties, nothwithstanding the severity of tropical storms, are not much rarer than with us. Many persons I have spoken to all agree that thunderstorms in England are more dangerous than in India. Is this a fact? and if so why? Do the discharges take place at a lower level with us? or is the accompanying rainfall less? Heavy rain, of course, tends to weaken the lightning It may be, however, that greater precautions against lightning are taken in tropical countries than in England, where storms are more irregular and unexpected. L. C. W. BONACINA.

July 1st, 1914.

INTERNATIONAL BALLOON ASCENTS.

By W. H. DINES, F.R.S.

July 6th, 1911.

Starting Point.	Country.	A (H_C.) miles.	B (T_C.) ° F.	C miles.	D ° F.	E miles.	F
Limerick.....	Ireland	7·5	—69	13·1	—58	35	E.N.E.
Petersfield	England ..	7·3	—81	10·6	—76	27	E.S.E.
Brussels	Belgium ..	8·1	—78	9·1	—70	12	S.S.W.
Lindenberg	Germany ..	6·7	—73	7·9	—63	36	S.S.W.
Paris	France ...	8·0	—87	10·5	—74	33	S.W.
Strassburg	Germany ..	7·9	—80	9·1	—76	40	S.S.W.
Munich	,, ..	8·0	—78	6·6	—67	39	S. by W.
Pavlovsk	Russia	6·8	—54	11·5	—51	48	S.S.W.
Nishni Olchedaeff	,, ..	6·1	—51	7·1	—47	24	N. by W.
Batavia	..	9·7	—120	10·2	—114	37	E.
Woodstock	Canada ..	8·7	—89	10·6	—81	44	N.E.

The pressure was very steady. An extensive high pressure area lay over Mid-Europe, with low pressure to the north and south. Except over Russia the temperatures are low for the summer. The return from Batavia, 6°, 11′ S., 106°, 50′ E., shows the usual low temperature prevailing at great altitudes in the tropics.

August 3rd, 1911.

Manchester	England ..	*7·2	—51	15·6	—53	73	E. by N.
Pyrton Hill	,, ..	7·5	—68	12·5	—62	73	N.E.
Brussels	Belgium ..	7·9	—76	9·6	—67	31	E. by N.
Lindenberg	Germany ..	7·0	—68	11·3	—51	7	S.W. by S.
Paris	France ..	7·9	—79	10·1	—62	72	E.
Strassburg.....	Germany ..	7·6	—69	8·3	—62	40	S.E. by E.
Munich	,, ..	7·9	—63	8·2	—62	39	S.S.E.
Pavia	Italy	7·5	—65	8·5	?	68	S.S.E.
Pavlovsk	Russia	7·9	—72	10·7	—53	36	E.S.E.
Nishni Olchedaeff	,, ..	5·9	—56	8·2	—51	28	N.W.by N.
Woodstock	Canada ..	8·1	—85	10·8	—80	58	N.E.

* Value indefinite.

A Height in miles of commencement of isothermal column.
B Temperature, F°., at bottom of column.
C Greatest height of reliable record in miles.
D Temperature, F°., at greatest height.
E Distance in miles of point where balloon fell.
F Bearing of falling point from starting point.

Anti-cyclones lay over Spain and Central Russia, and low pressure areas over the Balkans and in the North-West. Thunderstorms, occurred in Western Germany.

RAINFALL TABLE FOR JUNE, 1914.

STATION.	COUNTY.	Lat. N.	Long. W. [*E.]	Height above Sea. ft.	RAINFALL OF MONTH. Aver. 1875—1909. in.	1914. in.
		° ′	° ′			
Camden Square	*London*	51 32	0 8	111	2·28	1·15
Tenterden	*Kent*	51 4	*0 41	190	2·03	1·12
Arundel (Patching)	*Sussex*	50 51	0 27	130	2·13	1·03
Fawley (Cadland)	*Hampshire*	50 50	1 22	52	2·17	1·01
Oxford (Magdalen College).	*Oxfordshire*	51 45	1 15	186	2·27	2·48
Wellingborough (Croyland Abbey).	*Northampton*	52 18	0 41	174	2·10	2·40
Shoeburyness	*Essex*	51 31	*0 48	13	1·77	·46
Bury St. Edmunds(Westley)	*Suffolk*	52 15	*0 40	226	2·21	1·19
Geldeston [Beccles]	*Norfolk*	52 27	*1 31	38	1·77	1·27
Polapit Tamar [Launceston]	*Devon*	50 40	4 22	315	2·18	2·32
Rousdon [Lyme Regis]	,,	50 41	3 0	516	2·18	2·27
Stroud (Upfield)	*Gloucestershire*	51 44	2 13	226	2·43	2·55
Church Stretton (Wolstaston)	*Shropshire*	52 35	2 48	800	2·59	2·02
Coventry (Kingswood)	*Warwickshire*	52 24	1 30	340	2·52	2·44
Boston	*Lincolnshire*	52 58	0 1	11	1·95	2·57
Worksop (Hodsock Priory).	*Nottinghamshire*	53 22	1 5	56	2·06	2·09
Macclesfield	*Cheshire*	53 15	2 7	501	2·85	1·67
Southport (Hesketh Park)	*Lancashire*	53 39	2 59	38	2·26	1·35
Arncliffe Vicarage	*Yorkshire, W.R.*	54 8	2 6	732	3·63	2·90
Wetherby (Ribston Hall)	,, ,,	53 59	1 24	130	2·17	1·77
Hull (Pearson Park)	,, *E.R.*	53 45	0 20	6	2·09	1·39
Newcastle (Town Moor)	*Northumberland*	54 59	1 38	201	2·04	4·03
Borrowdale (Seathwaite)	*Cumberland*	54 30	3 10	423	6·94	3·09
Cardiff (Ely)	*Glamorgan*	51 29	3 13	53	2·55	2·49
Haverfordwest	*Pembroke*	51 48	4 58	90	2·74	1·54
Aberystwyth (Gogerddan)	*Cardigan*	52 26	4 1	83	2·97	2·19
Llandudno	*Carnarvon*	53 20	3 50	72	1·97	2·18
Cargen [Dumfries]	*Kirkcudbright*	55 2	3 37	80	2·84	·43
Marchmont House	*Berwick*	55 44	2 24	498	2·38	2·27
Girvan (Pinmore)	*Ayr*	55 10	4 49	207	3·04	·84
Glasgow (Queen's Park)	*Renfrew*	55 53	4 18	144	2·41	...
Inveraray (Newtown)	*Argyll*	56 14	5 4	17	3·64	2·23
Mull (Quinish)	,,	56 34	6 13	35	3·30	2·45
Dundee (Eastern Necropolis)	*Forfar*	56 28	2 57	199	2·06	1·04
Braemar	*Aberdeen*	57 0	3 24	1114	2·18	1·77
Aberdeen (Cranford)	,,	57 8	2 7	120	2·02	1·09
Cawdor	*Nairn*	57 31	3 57	250	2·13	1·02
Fort Augustus (S. Benedict's)	*E. Inverness*	57 9	4 41	68	2·07	1·46
Loch Torridon (Bendamph)	*W. Ross*	57 32	5 32	20	4·07	3·65
Dunrobin Castle	*Sutherland*	57 59	3 56	14	2·10	·87
Wick	*Caithness*	58 26	3 6	77	1·83	·84
Killarney (District Asylum)	*Kerry*	52 4	9 31	178	2·92	1·72
Waterford (Brook Lodge)	*Waterford*	52 15	7 7	104	2·79	1·19
Nenagh (Castle Lough)	*Tipperary*	52 54	8 24	120	2·70	·74
Ennistymon House	*Clare*	52 57	9 18	37	3·18	1·63
Gorey (Courtown House)	*Wexford*	52 40	6 13	80	2·59	1·13
Abbey Leix (Blandsfort)	*Queen's County*	52 56	7 17	532	2·58	1·30
Dublin (Fitz William Square)	*Dublin*	53 21	6 14	54	2·00	·88
Mullingar (Belvedere)	*Westmeath*	53 29	7 22	367	2·72	1·11
Crossmolina (Enniscoe)	*Mayo*	54 4	9 16	74	3·17	·87
Cong (The Glebe)	,,	53 33	9 16	112	3·18	·75
Collooney (Markree Obsy.)	*Sligo*	54 11	8 27	127	3·11	1·24
Seaforde	*Down*	54 19	5 50	180	2·88	1·39
Bushmills (Dundarave)	*Antrim*	55 12	6 30	162	2·56	1·35
Omagh (Edenfel)	*Tyrone*	54 36	7 18	280	2·82	1·11

RAINFALL TABLE FOR JUNE, 1914—*continued.*

RAINFALL OF MONTH (*con.*)					RAINFALL FROM JAN. 1.					
Diff. from Av. in.	% of Av.	Max. in 24 hours. in.	Max. in 24 hours. Date.	No. of Days	Aver. 1875—1909. in.	1914. in.	Diff. from Aver. in.	% of Av.	Mean Annual 1875-1909. in.	STATION.
—1·13	50	·19	6	12	10·96	11·13	+ ·17	102	25·11	Camden Square
— ·91	55	·50	23	8	11·44	13·08	+1·64	114	27·64	Tenterden
—1·10	48	·71	23	6	12·46	14·13	+1·67	114	30·48	Patching
—1·16	47	·60	23	8	13·31	14·00	+ ·69	105	31·87	Cadland
+ ·21	109	·64	9	9	10·60	10·55	— ·05	100	24·58	Oxford
+ ·30	114	·95	8	10	11·14	8·95	—2·19	80	25·17	Croyland Abbey
—1·31	26	·25	6	6	8·00	7·98	— ·02	100	19·28	Shoeburyness
—1·02	54	·49	9	8	10·76	11·32	+ ·56	105	25·40	Westley
— ·50	72	·49	9	8	9·61	9·83	+ ·22	102	23·73	Geldeston
+ ·14	106	·75	20	12	15·88	20·55	+4·67	129	38·27	Polapit Tamar
+ ·09	104	1·04	14	10	14·33	15·37	+1·04	107	33·54	Rousdon
+ ·12	105	1·08	9	11	13·08	13·17	+ ·09	101	29·81	Stroud
— ·57	78	·83	9	9	14·30	12·22	—2·08	85	32·41	Wolstaston
— ·08	97	1·25	9	9	12·75	9·80	—2·95	77	28·98	Coventry
+ ·62	132	1·05	9	9	9·86	9·37	— ·49	95	23·35	Boston
+ ·03	101	·84	9	9	10·80	8·08	—2·72	75	24·46	Hodsock Priory
—1·18	59	·43	9	13	14·76	15·33	+ ·57	104	34·73	Macclesfield
— ·91	60	·54	9	11	12·96	11·00	—1·96	85	32·70	Southport
— ·73	80	1·35	9	11	27·22	28·18	+ ·96	104	61·49	Arncliffe
— ·40	82	·75	9	6	11·63	9·19	—2·44	79	26·87	Ribston Hall
— ·70	66	·41	9	9	11·08	8·34	—2·74	75	26·42	Hull
+1·99	198	1·51	9	11	11·55	11·41	— ·14	99	27·94	Newcastle
—3·85	45	·73	20	18	56·38	63·88	+7·50	113	129·48	Seathwaite
— ·06	98	1·06	9	12	17·22	20·68	+3·46	120	42·28	Cardiff
—1·20	56	·43	9	9	19·45	17·92	—1·53	92	46·81	Haverfordwest
— ·78	74	1·08	20	10	18·12	20·76	+2·64	114	45·46	Gogerddan
+ ·21	111	·89	11	10	12·37	12·24	— ·13	99	30·36	Llandudno
—2·41	15	·15	9, 20	6	19·06	21·81	+2·75	114	43·47	Cargen
— ·11	95	·57	21	9	14·38	12·61	—1·77	88	33·76	Marchmont
—2·20	28	·17	7	16	21·10	24·87	+3·77	118	49·77	Girvan
...	...	...	...	...	15·51	...	...	...	35·97	Glasgow
—1·41	61	·37	26	16	29·32	35·54	+6·22	121	68·67	Inveraray
— ·85	74	·42	19	16	23·55	25·53	+1·98	108	56·57	Quinish
—1·02	50	·60	18	11	12·02	10·85	—1·17	90	28·64	Dundee
— ·41	21	·87	21	12	15·15	16·87	+1·72	111	34·93	Braemar
— ·93	54	·43	18	12	14·02	11·56	—2·46	82	32·73	Aberdeen
—1·11	48	·31	4	4	12·51	11·63	— ·88	93	29·33	Cawdor
— ·61	71	·23	20	16	20·22	19·43	— ·79	96	44·53	Fort Augustus
— ·42	90	·77	5	14	37·55	46·22	+8·67	123	83·93	Bendamph
—1·23	41	·22	18	11	14·28	13·75	— ·53	96	31·90	Dunrobin Castle
— ·99	46	·16	4,8,21	15	12·71	11·88	— ·83	93	29·88	Wick
—1·20	59	·46	21	12	24·87	30·68	+5·81	123	54·81	Killarney
—1·60	43	·30	19	10	17·40	15·35	—2·05	88	39·57	Waterford
—1·96	27	·47	19	7	17·51	18·42	+ ·91	105	39·43	Castle Lough
—1·55	51	·38	30	13	19·67	23·66	+3·99	120	46·52	Ennistymon
—1·46	44	·58	20	8	15·42	14·26	—1·16	92	34·99	Courtown Ho.
—1·28	50	·40	19	11	15·84	15·58	— ·26	98	35·92	Abbey Leix
—1·12	44	·33	9	9	12·15	9·01	—3·14	74	27·68	Dublin
—1·61	41	·45	19	9	16·01	15·77	— ·24	98	36·15	Mullingar
—2·30	28	·26	19	11	23·38	25·45	+2·07	109	52·87	Enniscoe
—2·43	24	·20	7	10	21·41	24·23	+2·82	113	48·90	Cong
—1·87	40	·23	7	13	18·83	20·49	+1·66	109	42·71	Markree
—1·49	48	·58	20	10	17·42	15·14	—2·28	87	38·91	Seaforde
—1·21	53	·34	22	12	15·49	15·99	+ ·50	103	37·56	Dundarave
—1·71	39	·25	19	13	17·10	18·69	+1·59	109	39·38	Omagh

SUPPLEMENTARY RAINFALL, JUNE, 1914.

Div.	STATION.	Rain inches.	Div.	STATION.	Rain inches.
II.	Warlingham, Redvers Road..	1·20	XI.	Lligwy	·78
,,	Ramsgate	1·24	,,	Douglas	·94
,,	Hailsham	1·39	XII.	Stoneykirk, Ardwell House...	·77
,,	Totland Bay, Aston House...	·84	,,	Dalry, The Old Garroch.....	·83
,,	Stockbridge, Ashley..	·26	,,	Beattock, Kinnelhead	1·21
,,	Grayshott	1·08	,,	Langholm, Drove Road	...
III.	Harrow Weald, Hill House...	1·52	XIII.	Meggat Water, Cramilt Lodge	2·28
,,	Caversham, Rectory Road ...	1·24	,,	North Berwick Reservoir.....	1·05
,,	Pitsford, Sedgebrook...	2·79	,,	Edinburgh, Royal Observaty.	1·00
,,	Woburn, Milton Bryant.....	2·60	XIV.	Maybole, Knockdon Farm ...	·88
,,	Chatteris, The Priory..... ...	2·16	XV.	Ballachulish House	...
IV.	Elsenham, Gaunts End	2·35	,,	Campbeltown, Witchburn ..	1·83
,,	Colchester, Hill Ho., Lexden	1·08	,,	Holy Loch, Ardnadam.....	...
,,	Ipswich, Rookwood, Copdock	·69	,,	Islay, Eallabus	...
,,	Blakeney.....	2·69	,,	Tiree, Cornaigmore	1·57
,,	Swaffham	2·07	XVI.	Dollar Academy	·71
V.	Bishops Cannings	1·82	,,	Balquhidder, Stronvar.....	...
,,	Wimborne, St. John's Hill...	1·67	,,	Glenlyon, Meggernie Castle..	1·81
,,	Ashburton, Druid House.. ...	1·52	,,	Blair Atholl	1·18
,,	Cullompton	1·95	,,	Coupar Angus	·94
,,	Lynmouth, Rock House	2·49	,,	Montrose, Sunnyside Asylum.	·95
,,	Okehampton, Oaklands.....	2·10	XVII.	Alford, Lynturk Manse	1·63
,,	Hartland Abbey.....	1·93	,,	Fyvie Castle	·82
,,	Probus, Lamellyn.....	1·89	,,	Keith Station	1·76
,,	North Cadbury Rectory.....	2·22	XVIII.	Rothiemurchus	...
VI.	Clifton, Pembroke Road.....	2·56	,,	Loch Quoich, Loan	7·50
,,	Ross, The Graig	3·17	,,	Drumnadrochit..... ...	1·04
,,	Shifnal, Hatton Grange.....	3·62	,,	Skye, Dunvegan	3·41
,,	Droitwich.....	2·15	,,	Lochmaddy Bayhead	1·94
,,	Blockley, Upton Wold.....	4·06	,,	Glencarron Lodge	4·11
VII.	Market Overton.....	...	XIX.	Invershin	1·22
,,	Market Rasen	2·13	,,	Melvich	2·03
,,	Bawtry, Hesley Hall	1·25	,,	Loch Stack, Ardchullin	3·82
,,	Derby, Midland Railway.....	1·84	XX.	Skibbereen Rectory	1·98
,,	Buxton	2·45	,,	Dunmanway, The Rectory ..	1·67
VIII.	Nantwich, Dorfold Hall	1·47	,,	Glanmire, Lota Lodge, No. 1	·84
,,	Chatburn, Middlewood	1·90	,,	Mitchelstown Castle.....	1·56
,,	Cartmel, Flookburgh	1·20	,,	Darrynane Abbey.....	1·80
IX.	Langsett Moor, Up. Midhope	3·69	,,	Clonmel, Bruce Villa	·90
,,	Scarborough, Scalby	1·99	,,	Newmarket-on-Fergus, Fenloe	·84
,,	Ingleby Greenhow	4·71	XXI.	Laragh, Glendalough	1·81
,,	Mickleton	2·60	,,	Ballycumber, Moorock Lodge	·76
X.	Bellingham, High Green Manor	2·46	,,	Balbriggan, Ardgillan	1·38
,,	Ilderton, Lilburn Cottage ...	3·80	XXII.	Woodlawn	1·46
,,	Keswick, The Bank.....	1·55	,,	Westport, St. Helens	1·20
XI.	Llanfrechfa Grange	2·81	,,	Dugort, Slievemore Hotel ...	2·50
,,	Treherbert, Tyn-y-waun	2·71	,,	Mohill Rectory	1·99
,,	Carmarthen, The Friary	1·74	XXIII.	Enniskillen, Portora.....	1·10
,,	Castle Malgwyn [Llechryd]...	1·52	,,	Dartrey [Cootehill]	1·48
,,	Crickhowell, Tal-y-maes.....	3·80	,,	Warrenpoint, Manor House ..	1·39
,,	New Radnor, Ednol	2·61	,,	Banbridge, Milltown	1·59
,,	Birmingham WW., Tyrmynydd	2·19	,,	Belfast, Cave Hill Road	1·52
,,	Lake Vyrnwy	...	,,	Glenarm Castle..... ...	1·33
,,	Llangyhanfal, Plâs Draw.....	3·90	,,	Londonderry, Creggan Res...	1·97
,,	Dolgelly, Bryntirion.....	2·32	,,	Dunfanaghy, Horn Head ...	1·38
,,	Bettws-y-Coed, Tyn-y-bryn...	3·57		Killybegs	2·33

METEOROLOGICAL NOTES ON JUNE, 1914.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Temp. for Temperature; Max' for Maximum; Min. for Minimum; T for Thunder; L for Lightning; TS for Thunderstorm; R for Rain; H for Hail; S for Snow; F for number of days Frost in Screen; f on Grass.

LONDON, CAMDEN SQUARE.—Beautiful sunny and warm weather generally with occasional light R. The duration of sunshine 236·6* hours, was the greatest amount since August, 1911. Duration of R, 17·6 hours. Mean temp. 62°·4, or 2°·3 above, the average. Evaporation 2·93 in. Shade max. 89°·0 on 30th; min. 41°·5 on 8th. F 0, f 0.

TENTERDEN.—Mostly cold and dull till after 9th. Showery from 6th to 9th and a good R on 23rd, otherwise very dry. Duration of sunshine 265·0† hours. Shade max. 81°·0 on 30th; min. 40°·0 on 9th. F 0, f 0.

TOTLAND BAY.—Duration of sunshine 274·5* hours, the brightest June since 1908. Shade max. 76°·0 on 30th; min. 41°·1 on 8th. F 0, f 0.

MILTON BRYAN.—A lovely month. The hot sun after rains dried the ground too quickly. Over ·50 in. of R fell in about 20 minutes on 8th

IPSWICH, COPDOCK.—A very dry month. The absence of R is being seriously felt. Duration of sunshine 245·2* hours and the highest for June in 12 years. Mean temp. 58°·1. Shade max. 82°·2 on 30th; min. 37°·5 on 8th. F 0, f 2.

ROUSDON.—On 14th T was heard over Portland Bill at 2 p.m. and a TS passed down Channel with much L followed by a fiercer storm about 4 p.m. T and L became incessant, and at 7.45 p.m. were coincident showing the storm to be close over this station. It passed over by 9 p.m.

MACCLESFIELD.—A grand sunny month. Most of the R fell in the early mornings and was followed by beautiful sunny days. Shade max. 82° on 30th.

SOUTHPORT.—Duration of sunshine 234·2* hours, or 23·4 hours above, average. Duration of R 29·1 hours. Evaporation 3·25 in. Mean temp. 57°·6, or 0°·9 above, average Shade max. 76°·0 on 15th; min. 41°·0 on 8th. F 0, f 0.

HULL.—Cloudy days up to 10th with squally winds and showers, then a fine dry period to the end broken only by T showers on 20th and 22nd. Duration of sunshine 156·2* hours. Shade max. 89°·0 on 30th; min. 39°·0 on 3rd. F 0, f 1.

HAVERFORDWEST.—Duration of sunshine 255·5* hours. Shade max. 73°·7 on 29th; min. 40°·0 on 27th. F 0, f 0.

BETTWS-Y-COED.—Wet from 7th to 11th, otherwise a fine month with temp. about the average. Shade max. 76°·0 on 30th; min. 39°·0 on 1st. F 0, f 0.

MARCHMONT.—Duration of sunshine 252·6* hours on 27 days.

EDINBURGH.—Shade max, 74°·0 on 30th; min. 39°·8 on 1st. F 0, f 0.

COUPAR ANGUS.—R about half the average. Mean temp. 57°·8 was unusually high.

DRUMNADROCHIT.—R 1·24 in. below the average. Low temp. and continuance of winds from northern semi-circle. Vegetation injured by drought.

LOCH STACK.—Duration of sunshine 165·3* hours.

DUNMANWAY.—A fine and warm month. On 21st ·50 in. of R fell in about 20 minutes at 4 p.m.

DUBLIN.—A fine dry month with a preponderance of winds from N.W. to N.E. Temp. was distinctly low in the first half of month, but the last few days days were warm. Mean temp. 57°·9, or 0°·5 above, average. Shade max. 76°·0 on 30th; min. 42°·8 on 1st. F 0, f 0.

OMAGH.—A fine dry month. All crops suffering from want of R. Hay crop very light. Shade max. 77°·0 on 15th; min. 40°·0 on 20th.

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* Campbell-Stokes. † Jordan.

Climatological Table for the British Empire, January, 1914.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Date.	Minimum. Temp.	Date.	Average. Max.	Min.	Dew Point.	Humidity.	Absolute. Max. in Sun.	Min. on Grass.	Total Rain Depth.	Days.	Aver. Cloud.
								0-100			inches		
London, Camden Square	55°6	9	20°9	24	42°4	33°7	35°5	88	76°9	18°6	·55	12	7·6
Malta	66·6	17	44·0	8, 24	57·4	46·8	...	74	124·0	.	3·83	16	2·3
Lagos	90·2	28, 31	71·0	14†	87·9	75·6	72·9	75	146·2	67·0	1·57	3	6·0
Cape Town	92·7	25	51·7	4	77·0	60·4	57·1	67	...	...	2·42	6	2·7
Natal, Durban ...	82·0	18, 22	63·0	10	77·4	70·0	68·5	76	...	...	3·06	13	7·0
Johannesburg	86·9	30	47·2	26	80·4	58·2	54·4	67	155·0	44·8	2·71	11	4·3
Mauritius	89·1	3, 11	68·3	2	85·9	72 4	70·3	76	159·8	63·5	6·00	21	7·9
Bloemfontein ...	97·9	3	56·5	23	90·8	63·3	58·4	59	...	...	2·38	11	1·8
Calcutta...	83·5	31	51·1	12, 13	77·7	56·2	56·8	71	...	44·7	·00	0	3·0
Bombay...	87·3	9	65·3	28	84·3	69·7	65·2	68	136·0	58·7	·00	0	1·5
Madras	84·8	29	63·4	27	83·6	67·9	65·4	72	150·0	59·4	1·06	2	2·9
Colombo, Ceylon ...	90·8	27	70·9	10, 15	88·2	72·3	70·6	75	166·1	64·7	·19	4	4·5
Hongkong	76·9	14	47·4	1	67·4	58·8	52·7	69	...	...	·00	0	3·9
Sydney	95·4	27	58·1	21	80·9	65·2	58·0	58	155·0	49·3	·66	9	5·3
Melbourne	97·9	7	47·2	28	78·0	56·1	50·8	55	159·1	43·1	1·45	6	3·5
Adelaide	102·7	24	53·4	14	83·7	59·5	51·4	48	164·9	44·2	1·07	5	3·0
Perth	102·3	28	54·0	9	86·7	63·6	56·0	51	177·3	50·3	·04	1	2·0
Coolgardie	107·8	17	53·0	12	94·2	63·2	50·1	33	183·8	51·4	·29	3	1·6
Hobart, Tasmania	88·0	25	45·7	20	70·6	52·9	46·4	54	147·0	39·9	·24	10	6·2
Wellington ...	79·6	30	48·6	15	71·2	59·0	55·1	70	150·6	35·0	2·60	11	7·0
Auckland	79·5	15	52·0	11	74·8	59·6	58·6	74	153·0	48·0	1·32	6	4·9
Jamaica, Kingston ..	89·4	10	63·9	29	86·9	68·8	65·0	78	...	...	·14	2	4·1
Grenada	85·0	12*	69·0	15, 28	83·4	72·8	...	73	136·0	...	1·80	15	2·0
Toronto	54·3	29	-22·0	13	33·3	17·8	20·5	87	86·4	-23·3	3·44	16	8·2
Fredericton	45·0	30	-24·0	18	21·8	-0·1	...	85	...	...	4·56	14	5·5
St. John, N.B. ...	46·7	30	-9·5	14	26·1	9·6	13·0	76	..	...	2·87	18	5·4
Edmonton, Alberta ...	42·9	5	-28·7	24	16·1	-0·8	...	92	75·2	-33·8	·64	10	6·3
Victoria, B.C.	52·2	11	28·0	28	45·5	38·7	38·0	87	...	...	8·47	27	8·3

* 13 and 14. † 15 and 22.

Johannesburg.—Bright sunshine 266·6 hours.

Mauritius.—Mean temp. of air 0°·1 below, dew point normal, and R 1·61 in. below, averages. Mean hourly velocity of wind 9·6 miles, or 1·5 below average.

Bloemfontein.—The hottest January on record here, 77°·1. R below average, with dry wind and dust.

COLOMBO.—Mean temp. of air 80°·2, or 1°·3 above, of dew point 0°·7 above, and R 3·34 in. below, averages. Mean velocity of wind 6·6 miles per hour. TSS on three days.

HONGKONG.—Mean temp. of air 62°·8. Mean hourly velocity of wind 13·4 miles. Sunshine 240 hours, the most on record, and the first January without R since 1884.

Melbourne.—Mean temp. of air 0°·4 below, and R ·37 in. below, averages.

Adelaide.—Mean temp. of air 2°·5 below, and R ·34 in. above, averages.

Coolgardie.—Temp. of air 1°·3 above, and R slightly below, averages.

Hobart.—Temp. of air 0°·7 below, and R 92 per cent. below, averages.

Wellington.—Mean temp. of air 1°·8 above, and R ·71 in. below, averages.

Auckland.—R less than half and mean temp. above averages.